English aspiration

(1) Consider the following English words, all of which contain voiceless oral stops.

(a)	*(b)*	*(c)*	*(d)*	*(e)*	*(f)*	*(g)*	*(h)*
pan	s**p**an	**p**ray	s**p**ray	a**pp**ear	a**pp**rove	com**p**are	as**p**ire
tar	s**t**ar	**t**ray	s**t**ray	a**tt**ach	a**tt**ract	con**t**ent	as**t**ound
kin	s**k**in	**c**ream	s**c**ream	a**cc**ord	a**c**ross	con**c**lude	as**c**ribe

- Examine your own speech: Which of the stops are aspirated? Do the words in each column show consistent behavior?

  It may help you to hold a tissue in front of your mouth as you produce each word, and observe where the tissue moves — indicating aspiration — and where it does not. But note that this doesn't always work perfectly, especially for [t] and [k], which have places of articulation inside the mouth.

  If you have experience using speech analysis software like Praat, you can record your own speech and look for aspiration on the waveform/spectrogram.

- Can you characterize the circumstances under which voiceless stops are aspirated in English? (You will probably want to transcribe the relevant parts of these words phonetically as you consider this question.)

(2) Now consider the indicated voiceless oral stops in these words. Do they pattern as you would expect, based on the analysis you have developed in (1)?

(i)
a**pp**laud
A**t**lantic
a**cc**laim